STATE WATER PROGRAM

LAKES of WASHINGTON

Volume I

WESTERN WASHINGTON

Third Edition

STATE OF WASHINGTON
Daniel J. Evans
GOVERNOR

DEPARTMENT OF ECOLOGY
John A. Biggs
DIRECTOR

90100513

State of Washington
Department of Ecology

STATE WATER PROGRAM

Water Supply Bulletin No. 14

LAKES OF WASHINGTON

Volume I

WESTERN WASHINGTON

By
Ernest E. Wolcott

Third Edition
Olympia, Washington
1973

STATE OF WASHINGTON
Daniel J. Evans
GOVERNOR

DEPARTMENT OF ECOLOGY
John A. Biggs
DIRECTOR

CASE BOUND $5.50

DEPARTMENT OF ECOLOGY, OLYMPIA, WASHINGTON

"The State of Washington possesses an unequalled, natural wealth in its lakes. It is important that information on this valuable resource be available to all its citizens and visitors of our beautiful state. The lakes of our state have many important uses. They not only provide water for selected consumptive purposes; but, also for swimming, fishing, wildlife environment and aesthetics.

The Washington State Department of Ecology has been directed by the State Legislature under the Water Resources Act of 1971 to develop a state water program. A major provision of this Act is to develop a comprehensive information system for the general public.

This publication, **Lakes of Washington**, has proven to be a valuable reference source for information. Previous editions have been exhausted.

With the legislative mandate to provide this water resources information, the Department is issuing this latest edition with corrected and updated information. We feel that this publication adds to our information system as required in the Water Resources Act of 1971.

The need for a comprehensive water resources management program is clear. We are confident that this new edition of the **Lakes of Washington** will enable our citizens to better appreciate these resources which contribute to the excellence of environmental quality in our state.

JOHN A. BIGGS

CONTENTS

(Continued on next page)

CONTENTS—Continued

Lakes of Western Washington

by

ERNEST E. WOLCOTT

INTRODUCTION

Purpose and Scope of Work

"Lakes of Washington" is primarily an evaluation of the waters contained in lakes in the area under discussion and is a part of an over-all inventory of the water resources of the State. This inventory was originally done by the Division of Water Resources of the Washington State Department of Conservation under the general direction of Murray G. Walker, Supervisor of the Division of Water Resources, and under direct supervision of Robert H. Russell, Assistant Supervisor.

During the investigation of Washington's waters, much interesting and valuable material was gathered which is not herein reproduced. Origin of names, legends, biological information, fish reproduction data, accessibility and recreational aspects, as well as other data, have been excluded because they are outside the province of this work.

Also, for the same reason, only the most brief descriptions are given, although many lakes, especially in the higher mountain regions, are exceptionally beautiful and lie in areas of scenic grandeur.

Although of great value, the recreational worth of Washington's lakes has not been discussed. Figures on the subject, although provided from authoritative sources, are largely estimates and vary considerably. However, Clarence F. Pautzke, Commissioner of the U. S. Fish and Wildlife Service and nationally known authority on lakes and fish, once made the following statement to the author: "The high mountain lakes are Washington's greatest unused recreational asset."

Discussion of the quality of water in Western Washington lakes has also been excluded from this work, as but few complete analyses have been made. It is generally conceded, however, that with the exception of a few lowland waters subject to local pollution, most of the lakes of Western Washington possess potable water of good to excellent quality.

Nineteen counties are classified as being in the area of Western Washington. These counties all lie west of the crest of the Cascade Range, which bisects Washington from Canada to Oregon in a north-south direction. Skamania County is included, although the southeastern part is considered to lie east of the Cascade Crest.

The 19 counties discussed in this volume have a total area of

25,649 square miles, or about 37 per cent of the State's total of 68,192 square miles. The area figures of individual counties and of the State as a whole are official figures supplied by the U. S. Bureau of Census and corrected to September 8, 1960.*

Meteorological data used in connection with county physiographies are from U. S. Weather Bureau statistics covering the 24-year period from 1931 to 1955 inclusive, unless otherwise stated.

Worthy of attention is the fact that most of the climatological stations in Washington are manned by volunteer or cooperative observers, generally necessitating the location of such stations in or near urban areas. As a result, the figures supplied do not necessarily reflect exact climatic conditions of the area under discussion.

Acknowledgments

The assistance of the State Department of Game and the State Department of Fisheries in supplying bottom contour survey charts, photographs, stocking records, and location of public fishing areas is gratefully acknowledged. In particular, the personal and wholehearted cooperation of the field personnel of these agencies in supplying detailed information was invaluable.

Trail Blazers, a group of people devoted to the high mountain regions, cooperated without reservation in furnishing data that otherwise in all probability would not have been available. Individual members of the Mountaineers, the White River Recreational Association and many high-country enthusiasts have all contributed to this work. Without the help of these and the many others too numerous to mention, this text would have been far less complete. Their help is deeply appreciated.

Personnel of the U. S. Geological Survey and the U. S. Forest Service have been most cooperative in assisting with maps and specific information. Personnel at both the Olympic and Mount Rainier National Parks were also most generous with their time, facilities and knowledge of the national park areas.

It would be remiss not to acknowledge and express appreciation for the moral help and encouragement received by the author over the years from Dr. Donald Hudson, Chairman of the Department of Geography; Dr. John C. Sherman, Associate Professor of Geography; and Dr. Willis R. Heath, Assistant Professor of Geography, all at the University of Washington. The advice and support of these men contributed greatly to the completion of this work.

The entire staff of the Department of Conservation were most helpful in the tedious task of assembling the text of this book for publication. Firsthand knowledge of various items, aerial photo interpretation, and help in ways too numerous to list were freely

*See appendix, Volume 2, for tabulation by counties of the State's total square miles and land square miles.

given to the author. In particular, the assistance of the following staff members and co-workers is gratefully acknowledged:

Marshall T. Huntting, Supervisor of the Division of Mines and Geology, for his assistance in supplying geological and topographical information;

Robert H. Russell, Assistant Supervisor, Division of Water Resources, for editorial and geological assistance;

Glen H. Fiedler, Deputy Supervisor, Division of Water Resources, for reservoir and other data;

Stuart E. Shumway, Senior Meteorologist, Division of Water Resources, for meteorological data;

John B. Noble, Geologist, Division of Water Resources, for his painstaking work in transcribing the lake survey charts for reproduction and preparation of the outline map used to illustrate township and range subdivisions of Western Washington;

Dee Molenaar and Eugene F. Wallace, Geologists, together with Fred D. Hahn, Engineer, for their interest and help in aerial photo interpretation.

Of most importance is the interest and support extended the author by Earl Coe, Director of the Department of Conservation, and Murray G. Walker, Supervisor of the Division of Water Resources. The backing of these men made possible the publication of this work.

Definition of a Lake

One of the first questions that arose when this work was started involved defining a lake and determining the minimum size of lakes to be included. There is no commonly accepted denominator which distinguishes between lakes, ponds, pools, etc., on the basis of size. A number of lakes less than one-half acre in area are named and shown on Washington maps. Others known as ponds cover many acres. Webster makes the following definition of a lake:

> "A considerable inland body of standing water; also an expanded part of a river. When a body of water is so shallow that aquatic plants grow in most of it, it is usually called a pond; when the pond is mostly filled with vegetation, it becomes a marsh."

For the purposes of this study, it was decided to tabulate all bodies of water which conform to Webster's definition of a lake and which are one acre or more in area, regardless of depth. In addition, all named lakes, even though less than an acre, are included.

The small marsh, for instance, provides water, food, and cover for wildlife, waterfowl nesting areas and in many instances, recreation. In general, the marsh which contains some open water the year around, even though quite shallow, is classed as a lake.

Normally, only lakes of one acre or more are listed separately. However, in some instances where a number of small lakes exist

within a limited area, all or most of which are under one acre in size, they are tabulated as a unit and the combined acreage given for all the lakes in the section or partial section involved.

Number of Lakes

No one can say accurately how many lakes there are in Western Washington or the State as a whole. Man-made ponds, reservoirs, and natural lakes all form and disappear with surprising frequency over relative periods of time. Most maps do not show all the lakes in a given area nor do they keep abreast of current changes. Every possible effort has been made to bring the information in this text up to the end of the year 1960. Included are data and discussions of 3,813 lakes.

How Lakes Are Formed

Natural lakes come into being in numerous ways. A number of lakes in the northern part of Washington were scoured out of the earth's surface by continental glaciers during Pleistocene Time. An even greater number in the area which had been occupied by these glaciers are in depressions left as the ice receded, leaving in its wake sand and gravel deposits. Detached blocks of ice in these deposits eventually melted, leaving depressions which filled with water. Such depressions are called kettles; and in some regions, particularly in the Lower Puget Sound area as far south as Tenino, they contain the predominant type of lake existing today. However, kettle lakes are not restricted to the region named.

There are variations of this type of lake. Many lakes of Mason and Kitsap Counties, including the small lakes in the bight of Hood Canal, are largely shallow depressions left on an irregular surface of till or hardpan deposited as the continental glaciers rode over the area.

Landslides sometimes block natural valleys or canyons, thus forming areas which fill with surface runoff water and become natural lakes. Evidence suggests that Lake Crescent in the Olympic National Park in Clallam County was thus formed.*

Glacial deposits around the lake indicate that the valley in which it lies was scoured out by the continental glaciers, as was the Strait of Juan de Fuca. However, this same valley extends eastward with only a small rise between the east end of Lake Crescent and Lake Sutherland and continues on downward to the Elwha River. This rise, (some 200 feet above the level of Lake Crescent) and the surrounding area to the north, are composed of material identified as slide debris which came down from the higher elevations to the north. It is entirely possible that this slide, at some early time,

*Brown, R. D., Jr., Gower, H. D., Snavely, P. D., Jr., 1960, Geology of the Port Angeles-Lake Crescent Area, Clallam County, Washington: U. S. Geological Survey Oil and Gas Investigations Map OM-203.

either formed or at least enlarged Lake Crescent by damming its assumed outlet to Lake Sutherland.

This theory is strengthened by the location of the existing outlet, the Lyre River, which lies in an unnatural location in relation to the normal drainage of the Lake Crescent trough. At one time, the Lyre may have been an inlet to the Lake Crescent valley, with rising water of the lake forcing it to reverse its direction of flow to the northward and the Strait of Juan de Fuca.

Local glacial action is responsible for many lakes in the higher mountain regions of Washington, particularly in the Cascade and Olympic Ranges. Limiting elevations cannot be given for such lakes; however, they are known to exist in a range between 2,500 feet to 5,000 feet or more above sea level.

Other lakes are formed as a result of valleys and canyons being dammed by alluvium deposited by tributary streams at their confluences with the primary stream, leaving areas which fill with runoff water.

In Washington, where beaver are numerous, there is an abundance of small lakes and marshes formed by the dams these animals build for their habitat. Generally shallow, such lakes often remain in existence for many years and may be classed as permanent lakes. Others dry partly or completely in periods of low precipitation and runoff, or because the dams are washed out or are removed by man. When the beaver migrate or are removed by trapping, such lakes usually disappear in a relatively short time due to deterioration of the dams.

A distinctive type of lake, which is actually not as plentiful as the name would imply, is the crater lake, or lake which occupies the crater of an extinct volcano. Battleground Lake in Clark County is an excellent example of this type.

Man-made ponds, lakes, and reservoirs are classified as artificial lakes and may be entirely the result of placing a dam in a locality which will impound water, such as Merwin Lake and Yale Reservoir on the Lewis River. In other instances where the surrounding topography is suitable, a dam may be placed at or near the outlet of a natural lake, thereby increasing its size and usefulness to man. Lakes Cushman, Baker, and Chester Morse (Cedar Lake) are all examples of this type of water impoundment.

Curiously enough, the amount of precipitation falling in a given area does not necessarily reflect in the number of lakes in the region. Many lakes exist in the semiarid regions of Eastern Washington, yet in some areas of high precipitation on the Pacific slope, lakes are noticeably scarce.

In the lower Columbia Basin area, seepage from irrigation waters has resulted in the formation of many lakes in depressions and rocky coulees which had been dry since their first exploration by man.

Other lakes, not in the irrigation areas but lying in regions where precipitation is light, may be "ground water" lakes, many of which have no inlets or outlets.* These lakes reflect the regional ground water surface of the areas involved.

Most of the water runoff on the Pacific slope of Washington, particularly in the southwest region, descends via sharply defined valleys to the sea. There are few depressions where lakes might form naturally, and landslides or accumulated debris which might form dams are generally washed out by the descending streams during periods of peak water runoff.

Location of Lakes

A navigator on the trackless areas of an ocean uses latitude and longitude figures to fix his position because he has no landmarks or other means of indicating his exact location. On land areas, once they have been surveyed, it is common practice to locate any particular place by means of townships, ranges and sections. Location by latitude and longitude is equally correct, but the terminology is generally unfamiliar to the layman, and many maps are reproduced which do not lend themselves to this method.

Townships and ranges are numbered consecutively from base lines established by the U. S. Bureau of Land Management. In Washington, all townships are numbered northward from the Willamette Base Line which runs east and west through Portland, Oregon, following a parallel to the earth's equator.

Ranges are numbered consecutively east or west, as the case may be, from a north and south base line, which in Washington is called the Willamette Meridian. The Willamette Base line and the Willamette Meridian intersect at approximately 122 degrees, 44 minutes West Longitude; and 45 degrees, 31 minutes North Latitude near the western city limits of Portland.

Townships in Washington are numbered 1 North, 2 North (T. 1 N., T. 2 N.,), etc. Ranges are numbered 1 East, 2 East, or 1 West, 2 West (R. 1. E., R. 2 E., R. 1 W., R. 2 W.), etc., depending upon whether they lie east or west of the Willamette Meridian (see diagram 1).

Each township is theoretically six miles square and is divided into 36 sections. Actually, due to survey errors and allowances for the curvature of the earth, they vary in size. Corrections are made in sections along the north and west borders of the townships involved. In some instances, entire township consecutive numbers are eliminated in making such corrections.

The 36 sections of a typical township are numbered as shown in

*Stokes, Wm. Lee and Varnes, David J., 1955, Glossary of Selected Geologic Terms: Colorado Scientific Society Proceedings, Vol. 16.
Ground water, distinct from surface water runoff, "Subsurface water in a zone of saturation. The term is not meant to include a temporary saturated zone at or near the ground surface that is produced immediately after precipitation or by thawing."

diagram 1, always starting at the upper right-hand corner. If a correction necessitates eliminating part of a township, the remaining sections are numbered in the same manner as if the entire township were shown.

DIAGRAM 1

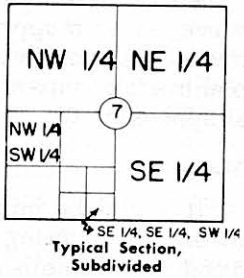
R. 2 E.

T. 16 N.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Typical Township

DIAGRAM 2



Typical Section, Subdivided

DIAGRAM 3

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

7

Typical Section, Alphabetically Subdivided

Each section may be divided into quarters and each quarter subdivided into quarters which may again be quartered and so on, to designate locations within the section. Diagram 2 shows a typical section partially divided to illustrate this point. Subdivided quarter sections as shown in the diagram would read "the NW¼SW¼" and "the SE¼SE¼SW¼." Since each section theoretically is 1 mile square or 640 acres, it follows that one quarter of a section would equal 160 acres, and one quarter of a quarter section, 40 acres.

For the purposes of this text, one quarter of a quarter of a section was deemed sufficiently small for use in locating the lakes involved. In giving the location of a large lake covering most of a section or more than one section, in general the outlet point was used for purposes of listing.

To conserve space in the pages of this book, a system is employed which utilizes letters to denote the quarter of a quarter section (see diagram 3). It should be noted that in using this method a point listed in the text as Sec. 1-A would be the NE¼NE¼ of Sec-

tion 1. 1-Q would be the SW¼SE¼ of the section, and so on. The letters "I" and "O" are not employed to avoid confusion with the numbers one and zero.

Lakes are listed from south to north by counties, following consecutive township numbers. Ranges west of the Willamette Meridian are listed first, followed by ranges east of the Willamette Meridian.

A considerable part of Washington has not yet been adequately surveyed or mapped. To list lakes falling within such areas, the townships, ranges and sections projected on U. S. Forest Service planimetric maps are utilized, or are estimated and the location given as approximate.

Maps

It would be impossible to reproduce the several hundred maps utilized in covering the areas involved in this work. For this reason, a code was established for the maps used, with the reference number following other tabulated data for the lake listed. A list of the reference maps is included in the appendix with the appropriate code numbers in numerical order.

Many lakes exist which are not shown on the maps employed. Some of these were verified by personal visits, others by aerial photographs or from reliable reports. Therefore, a reference may not show a certain lake, but merely show the area in which it lies.

Two sources of maps are referred to in this text, and maps from either source are available to the public at modest prices. These are the U. S. Geological Survey topographic quadrangles, with contour lines showing elevations above mean sea level, and the U. S. Forest Service planimetric quadrangles, which do not have contour lines.

Names of Lakes

In assembling this text, particular attention has been paid to the correct names of lakes. In literally hundreds of instances, it was necessary to interview numerous people, consult old records, and actually determine who named a given lake and find out for whom or for what it was named.

The names listed in this text, in every instance as far as could be ascertained, are those recognized by persons familiar with the lake involved. Many small mountain lakes as well as a number of lowland lakes carry such names, although they have never been listed with the U. S. Board on Geographic Names.

Names are often changed in the course of usage; and in some cases, the name in common use is not the correct name as recognized by the U. S. Board on Geographic Names. An example is Cinder Lake near Black Diamond in King County. Although this lake lies wholly within a large cinder bed left by former coal min-

ing activities and is named on U. S. Geological Survey maps as Cinder Lake, three local residents who had lived in the region for many years testified when interviewed that they had never heard of it in any way but Ginder Lake; and as such, it is commonly known. Investigation failed to disclose any reason why it should be called Ginder Lake.

It has been found that the habitues of a given lake are generally reluctant to accept a new name in place of one which they have known for years. However, there are undeniably instances where such changes are for the general good to avoid duplication of names. As the waters of this state have not been alphabetically cataloged heretofore, it is surprising to discover how many lakes, sometimes in close proximity, have duplicate names.

For obvious reasons, lakes which have the term "Lake" before the name, such as Lake Washington, Lake Goodwin, etc., are cataloged as Washington Lake, Goodwin Lake, etc., to permit alphabetical indexing.

Every effort has been made to check the correct spelling of place names and lakes mentioned in this book. Such names as Mowitch Lake in King County and Mowich Lake in the Mount Rainier National Park were never resolved, as the name "Mowich," however it is spelled, is a Chinook Indian word meaning "deer", and so far as the author could find out, is spelled any way to produce the desired sound. Gray Wolf River (on U. S. Geological Survey maps) or Greywolf River (on U. S. Forest Service maps) in Clallam County falls into the same category.

In nearly all instances, the name as spelled on the U. S. Geological Survey or U. S. Forest Service maps was accepted as correct, unless research disclosed a preferred spelling.

Reservoirs

In general, any body of water either man-made or increased in size by a man-made structure is classed as a reservoir. This classification extends to and includes farm ponds of sufficient size to be listed herein.

Washington is rapidly becoming more and more water conscious, and there are steadily increasing numbers of reservoirs and farm ponds. Many of these are not shown on the latest maps. Such projects are listed in this text only if a permit to construct has been granted by the Supervisor of the Division of Water Resources of the State of Washington, and work has been actually begun or completed, or a reasonable certainty exists that the project will be constructed. The acreages of proposed projects of this type are not included in the total given for the various counties of the State unless they are actually under construction.

To the layman, figures given for the storage capacity of a reser-

voir may be misleading, because there are basically three ways of expressing the storage capacity of a reservoir. First, there is the total volume of water existing behind the impounding structure from the ground up to the water surface. This is correctly stated as the **total volume** rather than the storage capacity.

Second, if a dam is built at or near the outlet of an existing lake, the **total storage** capacity is only the amount of water artificially stored by the dam, not including any waters existing before the dam was built.

Third is **usable storage,** which is the amount of water that may be taken from a reservoir down to a predetermined level, leaving a portion of the impounded waters unused. Usable storage is generally referred to as "live storage" and the unused portion called "dead storage."

Storage capacity is usually referred to in terms of acre-feet, an acre-foot being one acre in area and one foot deep. Thus a square mile of water exactly one foot deep throughout would contain 640 acre-feet of water. In a lake or reservoir, the acre-feet of water are computed by calculating the average depth and multiplying this figure by the number of surface acres.

In this connection, one acre of surface is defined as an area containing 43,560 square feet. If the area under consideration is square, it would be 208.71 feet on each side. In estimating the size of a lake, a good comparison would be to remember that an acre is slightly smaller than a regulation football field, which contains 45,000 square feet.

The storage capacities given in this text were obtained from ground surveys, reservoir plans, or were supplied by authoritative sources. The figures for most major reservoirs are those listed in Mermel's "Register of Dams in the United States" (1958), which gives as "reservoir capacity" the "total original content of the reservoir at the time of construction of the dam." This means the design capacity of the reservoir as constructed.

The information on reservoirs has been updated to January 1, 1972 for this edition.

Estimates

It was with some reluctance that the term "estimated" was used in this text, and it requires some explanation. As used herein, the term means more than just a wild guess. It represents a figure based upon personal observation or some reliable source of information which gives a reasonably close approximation of an unknown correct figure.

Likewise, the terms "about" or "approximately" are used to define a figure which is considered more nearly correct than an estimate. For instance, a lake elevation may be given as "about"

a certain height above sea level, taking into consideration the nearest contour line on a topographic map.

Distances

All distances given are direct air line as shown on maps and are generally given in feet or miles. The compass points (N, NW, SE, etc.) are used loosely with no attempt to have an exact point where one changes to the other.

Where possible, distances are given from some known or marked topographic feature or town. In giving distances from a large town or city, the approximate center of the business section or main intersection of business streets is employed as the starting point. If a distance is given from a mountain, it is assumed to be from the summit. If from a lake, unless otherwise specified, distances are from the nearest point of the lake used as a starting point.

Acreages

All acreages are surface acres with islands excluded unless otherwise specified. Acreage figures are arrived at by several methods. The majority are computed by use of a planimeter if the map employed was prepared from recent aerial photos. On others, particularly small lakes, acreages were computed by use of grids. However, whenever possible, these figures were checked by personal observation, aerial photos, surveys, and reports from various sources. In many instances, acreages given are not those calculated by planimeter, as observation or photographs proved conclusively that the lake concerned was larger or smaller than shown on the map employed. Also, many lakes have wide seasonal fluctuations, or have changed their characteristics since the map utilized was prepared. This is also true for lakes surveyed; and for these reasons, both the computed and surveyed acreages are supplied.

Drainages

Many lakes are shown on topographic maps in areas where the contour lines fail to show definite drainages. A large percentage of such lakes are thus shown because they do not have permanent or intermittent outlets other than by underground seepage. Water losses from many lakes are almost entirely from evaporation.

Interpretation of aerial photographs taken at high altitudes often fails to disclose the small outlet stream hidden under dense timber or brush, which leaves the cartographer with no choice but to show the lake with no outlet.

It is possible that the drainages given for some lakes in this

text are erroneous. Contour lines around lakes of doubtful drainage were carefully studied, and in a number of instances field trips were made to walk out the drainage in question.

Drainageways are traced to the nearest river, with the thought in mind that this would simplify tabulation of river system watersheds when hydrologic studies are made.

Elevations

Elevations are given in feet above mean sea level as shown on topographic maps. They are taken from the nearest contour lines unless specifically surveyed. For areas where topographic maps are not available, elevations were generally estimated from the U. S. Geological Survey regional maps with 200 and 500-foot contour intervals on a scale of 1/250,000.

Fish Species

As supplemental information, the species of game fish contained in Washington's various lakes are listed whenever reliably known. This information was supplied largely from the files of the State Department of Game and the field personnel of that department, and in many instances from the archives of the Trail Blazers.

It should be noted that fish species in a given lake may be subject to change from year to year. For instance, a lake stocked with rainbow trout which do not reproduce because of unsuitable spawning areas will produce rainbow only throughout the natural lives of the fish released into the lake. Such fish could live to 8 or 9 years of age in the wild. No attempt is made to list the predominant species in waters where several species have been introduced.

A list of abbreviations used in designating fish species is contained in the appendix.

Abbreviations

A number of abbreviations are used in the text of this work to conserve space. In most instances, the meaning of the abbreviation used is self-evident, however, a complete list of abbreviations is given in the appendix.

Authority

Not all data in this text are necessarily supplied by the authority quoted. A reference map, as explained elsewhere, is listed primarily to show the location or region in which a body of water lies. Information obtained from any source considered reliable was evaluated before being tabulated and presented.

Summary

No attempt has been made to show the availability of any waters to the public other than to show public fishing areas owned or controlled by the State Department of Game. These are shown by the familiar black triangle used in the seasonal fishing pamphlets issued by the Department of Game. On lakes for which survey charts are available, these areas are shown in appropriate locations on the charts.

The brief discussion of the physiography of each county is presented to give the reader a general idea of the region involved, the type of lakes contained therein, and other items of general interest.